CLAIMS

1. A non-aqueous electrolyte secondary battery comprising: a positive electrode; a negative electrode; a separator interposed between said positive electrode and said negative electrode; a non-aqueous electrolyte; and a porous insulating film adhered to a surface of at least one selected from the group consisting of said positive electrode and said negative electrode,

said porous insulating film comprising an inorganic oxide filler and a film binder,

wherein the ratio R of actual volume to apparent volume of said separator is not less than 0.4 and not greater than 0.7, and

wherein said ratio R and a porosity P of said porous insulating film satisfy the relational formula:

$-0.10 \leqq R-P \leqq 0.30$.

2. The non-aqueous electrolyte secondary battery in accordance with claim 1,

wherein 90% cumulative volume pore size D90 in a pore size distribution of said porous insulating film measured by a mercury intrusion porosimeter is not less than 0.15 μm.

3. The non-aqueous electrolyte secondary battery in accordance with claim 1,

wherein a void capable of retaining said non-aqueous electrolyte is formed on an adhering interface where said

porous insulating film adheres to said electrode surface.

4. The non-aqueous electrolyte secondary battery in accordance with claim 3,

wherein a void size distribution of said adhering interface measured by a mercury intrusion porosimeter has a peak in a region ranging from 1 to 4 μm.

5. The non-aqueous electrolyte secondary battery in accordance with claim 3,

wherein said electrode surface to which said porous insulating film adheres has an average surface roughness Ra of 0.1 to 1 μm.

6. The non-aqueous electrolyte secondary battery in accordance with claim 1,

wherein said inorganic oxide filler comprises polycrystalline particles, and

wherein said polycrystalline particles each comprise a plurality of primary particles that are diffusion-bonded together.

7. The non-aqueous electrolyte secondary battery in accordance with claim 6,

wherein said primary particles have an average particle size of not greater than 3 μm.

8. The non-aqueous electrolyte secondary battery in accordance with claim 6,

wherein the average particle size of said polycrystalline particles is not less than twice the average

particle size of said primary particles, and not greater than 10 μm.

9. The non-aqueous electrolyte secondary battery in accordance with claim 1,

wherein the amount of said film binder contained in said porous insulating film is not greater than 4 parts by weight per 100 parts by weight of said inorganic oxide filler.

10. The non-aqueous electrolyte secondary battery in accordance with claim 1,

wherein the amount of said film binder contained in said porous insulating film is not less than 1 part by weight per 100 parts by weight of said inorganic oxide filler.